Trns

approach

JANUARY 1983 THE NAVAL AVIATION SAFETY REVIEW

Don't get pulled under

RUMORS never seem to eject in safe envelopes. You can find them anywhere, floating face down in the open ocean or swirling in your latest cup of readyroom coffee.

Rumors are shroudlines that can tangle your confidence and pull you under.

It's time to replace rumors with facts. In the world of ejections, those facts are published in the EMERGENCY AIRBORNE ESCAPE SUMMARY. Consider this info about the FLU-8/P saltwater-activated LPU:

> The incorporation of the FLU-8/P automatic inflator to fleet lifevests played a very important role in this increased survival. Of the 23 ejectees whose lifevests were reported to have been equipped with the FLU-8/P, 7 were automatically inflated upon water entry. Of these seven, in three cases the automatic inflation feature was credited with having saved the lives of the ejectees. Also, of the four overwater fatalities, two bodies were recovered because of the automatic inflation of the lifevest. Both ejections were out of the ejection envelope, and one pilot had suffered multiple extreme injuries on water impact. The other pilot had survived water impact and drowned shortly thereafter. Without the FLU-8/P automatically inflating the lifevests, both bodies would most likely have been lost at sea. The other two overwater fatalities were also out of the ejection envelope. In one case, the only thing seen following ejection was a pencil-shaped splash 1.4 seconds after rear-seat ejection. The remaining fatality was found in a swampy area, totally submerged in water except for one shoulder. He had drowned by aspiration of water and mud.

For more hard numbers on ejections, see your safety officer or pick up a telephone and dial

Autovon 690-3494.

Ask for a personal copy of the latest ESCAPE SUMMARY. It's a 34-page report filled with exact figures on ejection and bailout survival percentages, ejection injuries, and speed and altitude tables.

Rumors can release their koch fittings at 500 feet and still survive. You can't. Rumors would never bother to call for a free ESCAPE SUMMARY.

We're hoping you will!

LT Colin Sargent

approach

Don't get snowed by winter operations! For a blast of cold wind, see "A Hurricane By Any Other Name," by LT C. D. Sten, VP-10. Photo by LCDR Dale E. Smith, CINCLANTFLT Public Affairs.

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Blueprint for

IT was a dark threat. Numerous thunderheads were developing over the southern Louisiana coast, with its standard array of ominous, expanding cells. By late afternoon, heavy convective currents, high moisture levels and overbearing, hot temperatures deepened the sky's hint of violence.

At Moisant International, several aircraft waited in line for takeoff clearance. Reports of wind shear were being transmitted over tower and ground frequencies. Several aircraft on final had made pireps regarding the phenomenon. They'd encountered fluctuations in indicated airspeed on approach, but nothing too severe.

Clipper 759 was taxiing for takeoff. Unknown to the crew, a flight departing on another runway had just finished what they considered an abnormal takeoff. Heavy rain and some wind change on takeoff had forced them to rotate early. Meanwhile, virtually unnoticed by any of the departing aircraft, thousands of tons of warm, moist air had been

disaster

By LCDR Joseph F. Towers, USNR
VR-57

APPROACH **diagrams by Frank L. Smith**

drawn aloft by convective clouds as they billowed and expanded above the departure path of Runway 10. By now, an intense, localized downburst of violent wind and torrential rainfall was descending with increasing intensity from above 10,000 feet. The sky was overcast with a wall of heavy rain hitting the earth toward the far end of the runway. The gust front (an invisible cold air outflow produced by the downburst as it hits the earth and spreads out radially) was forming.

Clipper 759 was cleared for takeoff with no specific wind shear alert given, since none apparently existed at the time. The liner accelerated in the rain-drenched environment. Rotation and liftoff were as prescribed. The landing gear was retracted on schedule as a positive rate of climb was noted. Suddenly, acceleration virtually ceased. The captain, recognizing that his craft was settling, directed to the copilot: "Come on back, you're sinking, Don — come on back." The next and final sounds heard on the cockpit voice

recorder were those of the ground proximity warning system and initial impact.

The flight was airborne only 20 seconds. It had become the unfortunate victim of a very unique and little-understood meteorological phenomenon, a phenomenon that doesn't like to share the same point in space and time with anyone or anything. Takeoff a few minutes earlier or later could have meant the difference between life and death.

Flight recorder data reveals that the maximum altitude obtained was less than 100 feet. Airspeed decayed from a maximum of 160 knots to a minimum of 142 knots over the first 14 seconds of flight. Approximately 6 seconds later, initial impact occurred with an indicated airspeed of 160 knots and a descent rate exceeding 2,000 fpm. Under normal conditions, the aircraft should have been accelerating and climbing. Neither occurred.

What exactly is this powerful force of nature that can take a normally functioning craft — flying in a relatively clean configuration at takeoff thrust, 20 to 30 percent above computed stall speed — and, in a mere 20 seconds, cause it to be literally beaten into the ground?

Such a phenomenon is nothing new to Dr. Theodore Fujita, a meteorologist with the department of Geophysical Sciences at the University of Chicago. The discovery of this force, initially termed downburst, originated with his investigation of the J.F.K. Airport wind shear mishap on 24 June 1975. At first, the existence of such a phenomenon was treated with skepticism. No such doubt exists today. According to Dr. Fujita, this meteorological occurrence, now technically known as a **microburst**, is an intense, highly-localized downburst with velocities up to 60 knots or more that hits the earth and spreads out horizontally in a radial burst of wind. Its dangerous phase exists for only a few minutes prior to dissipating. A microburst may be produced by one or more expanding cells beneath *convective clouds* and covers a very small geographical area (up to approximately 2½ miles in diameter). Once produced, these wind patterns do not remain stationary over the earth. As a result, one aircraft may be virtually unaffected, while the next may be knocked out of the heavens.

Convective clouds are characterized by unstable, moist air with extensive vertical development. Examples are cumulus, towering cumulus, and cumulonimbus (thunderstorm) buildups. All produce intense vertical updrafts and downdrafts.

In case you're wondering just how to avoid such an encounter, there seems to be no easy solution at this time. According to Dr. John McCarthy, a scientist with the Joint Airport Weather Studies (JAWS) project in the Denver area, two kinds of microbursts exist. One type is associated with large thunderstorms, while the other type seems to occur in much more benign-looking clouds that may appear very weak in standard weather-radar returns. This second type may appear inauspicious from a distance, but in fact it can produce very strong outflows. **Wind shear in microburst form is just as likely to appear in a little- or no-rain situation as it is in a very heavy-rain situation.** Data does not lead us to believe that there is any correlation between rainfall rate and the existence of wind shear. As for radar reflectivity to indicate the possibility of potential wind shear, you just can't rely on it. Furthermore, there's no correlation between storm intensity and microburst development. I'm not saying that a thunderstorm won't develop an intense downburst with an associated gust front; it's just that microbursts may or may not develop under such conditions. (To keep it simple, however, if thunderstorms are present, expect trouble. And remember, you may find it elsewhere, beneath any *convective clouds*.)

The JAWS project was formed for the definitive study of microbursts and represents the research efforts of a variety of scientists and organizations. So far, of the 62 microbursts studied, about 60 percent have occurred in non-thunderstorm situations while 40 percent occurred in embedded thunderstorms with rain, lightning, etc. When complete, the project should offer some very conclusive information on the phenomenon.

One telltale sign of this very dangerous situation is the presence of *virga*. This ethereally beautiful phenomenon, occurring primarily in dry climates, is precipitation falling from the sky that evaporates before it hits the ground. During the evaporation process, the downdraft is cooled,

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causing it to accelerate more rapidly downward. *I would not recommend an approach or takeoff in the vicinity of virga, since you can almost be assured that a fast-moving downflow exists.*

Another recent development concerning wind shear is the **Low Level Wind Shear Alert System** (LLWAS), a computerized marvel presently installed at some civil fields to detect hazardous wind shears at low altitudes. The system consists of a network of ground-based anemometers that measure and compare wind direction and velocity. Still, it's not entirely effective in detecting microbursts. Airborne and ground doppler radars, along with aircraft detection and alarm systems, may contribute substantially to future safety in this area.

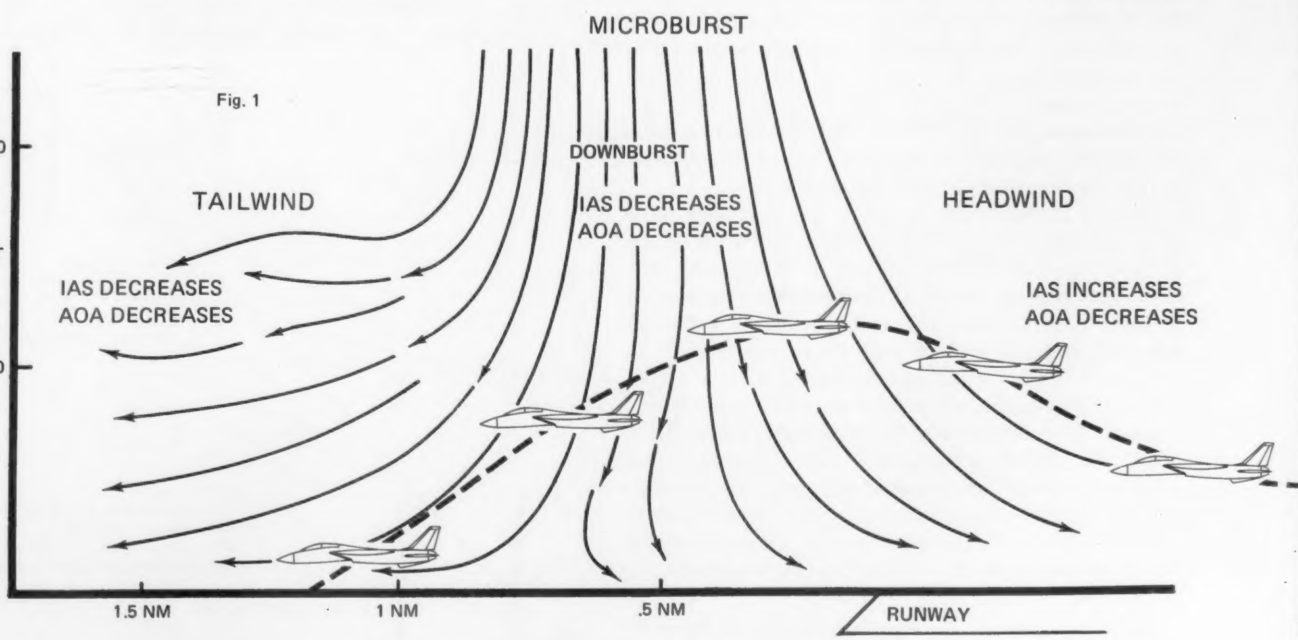
As far as heavy rain is concerned, no empirical data exists linking detrimental effects of heavy rain to an airfoil in flight (such as significant increases in drag and decreases in lift). At present, in my opinion, heavy rain by itself does not present a real danger to flight. In contrast, wind shear by itself can dangerously affect flight. Wind shear can often appear with heavy rain in unsafe flight conditions. This shouldn't be misinterpreted to imply that heavy rain is the culprit.

A microburst has three separate phases as an aircraft traverses it laterally. Figure (1) illustrates a microburst in its classic form. All three phases consist of intense, violent winds that shear off in various directions. The main force is downward, with an associated gust front that moves outward radially from the focal point of the microburst as it nears the earth. Depending on the relative flight profile, it's possible for an aircraft to miss one phase or another or to encounter only part of the crosswind burst.

Wind shear patterns associated with microburst conditions in, around and below convective clouds are extremely complex, often unpredictable and very powerful. These shear conditions may show up as very rapid changes in wind speed or direction (both horizontally and vertically) over relatively short distances. They're especially capable of producing conditions that can easily exceed the aerodynamic capability of virtually any aircraft, both military and commercial. By now, this should be self-evident.

Theoretically, initial signs of a pure headwind burst should include an increase in indicated airspeed and a nearly constant angle of attack. This increase in dynamic pressure, with a relatively constant C_L, generates additional lift. As a result, aircraft performance increases and a higher-than-normal flight path is achieved. The headwind phase begins to develop a downward vector component as the wind pattern transitions to the downburst phase. During this period, the resultant relative wind continuously reduces the angle of attack. A Navy tactical aircraft would probably notice a reduction in AOA along with a higher IAS as the relative wind comes more in line with the wing. As the downburst phase is entered, cockpit indications will register a further reduction in AOA, accompanied by decaying IAS.

Aircraft performance rapidly deteriorates from here. Let's assume that we don't change our thrust setting or regulate our pitch attitude. By now it should begin to



Consider this microburst pattern in the vicinity of an airfield, with the anticipated flight profile of an aircraft under constant thrust setting and neutral attitude. An aircraft flying through such a condition will experience significant gains followed by losses of indicated airspeed and critical reductions in angle of attack. The combined reduction in indicated airspeed and AOA will severely impair the aircraft's ability to generate lift and sustain flight.

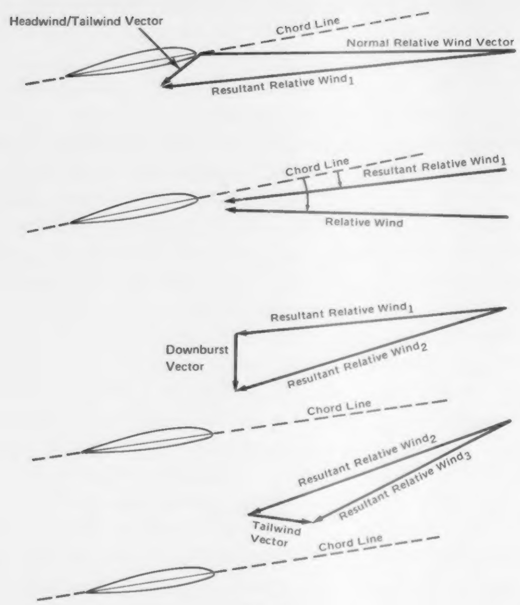


Fig. 2

This "negative-lift" theory may provide a partial explanation for wind shear effects upon aircraft during flight through microburst conditions, with or without severe indicated airspeed loss.

register that this is a very abnormal and dangerous flight regime. The thought of having a low IAS with a reduced AOA during essentially 1-G flight becomes confusing at best. As the flight profile continues, both IAS and AOA will be continuously reduced, with more critical deterioration in aircraft performance. So if you're ever caught in such a situation, expect some apparently strange and conflicting information on your instruments. These conditions are not related to normal flight parameters. And remember, some extreme measures may be required to survive.

Before I continue with a theory I've developed on a transitory regime of negative lift during microbursts, I'd like to make two important distinctions. First, airspeed indicators measure the velocity of the airstream, thus sensing dynamic pressure. Secondly, AOA indicators (when so equipped) primarily read the angle of the relative wind.

Figure 2 shows the critical reduction in angle of attack produced by the resultant relative wind as it continuously changes with respect to time. This constantly reduces the lift coefficient. If the downward vector components (or cumulative effects thereof) are of substantial magnitude in relation to the existing relative wind vector, the AOA can be reduced to zero and even negative values. (A negative AOA has developed when the resultant relative wind is coming from above the chord line.)

Rotating the aircraft to a higher deck angle can change the AOA to a more favorable reference. The application of maximum thrust will normally serve to accelerate the aircraft mass, thereby generating a new relative wind and AOA that places the aircraft in a safer flight regime. Prior to the encounter, faster approach and departure speeds diminish the detrimental effects of the downward vector components. Furthermore, this provides an increased buffer above stall and gives the aircraft a greater energy tradeoff (kinetic energy for potential energy), should it be required. In many situations it takes only a relatively small change in AOA (less than 10 degrees) to critically affect the aerodynamic performance of an airfoil.

Microburst parameters are not representative of steady-state wind conditions with an easily-definable relationship between indicated airspeed and angle of attack. Under certain conditions, wind shear may produce changes in indicated airspeed with or without a corresponding change in angle of attack. Conversely, it may produce changes in angle of attack with or without significant changes in indicated airspeed.

A severe reduction in angle of attack toward negative values can result in zero or inverse generation of lift (see Fig. 3). Under normal flight parameters, negative AOA conditions are virtually unheard of and practically impossible to obtain. But imagine for a moment an aircraft on final approach or takeoff with the relative airstream impacting an imaginary chord line from below. The airfoil is under the influence of a positive angle of attack with a corresponding positive lift coefficient for the given airfoil configuration. The resultant lift sustains the aircraft in flight.

Now, complicate the situation with the entry of a massive, concentrated column of air traveling at a downward velocity of up to 60 knots. (This can easily occur during flight through the downburst area of a microburst.)

Through basic vector analysis, visualize the reduction in

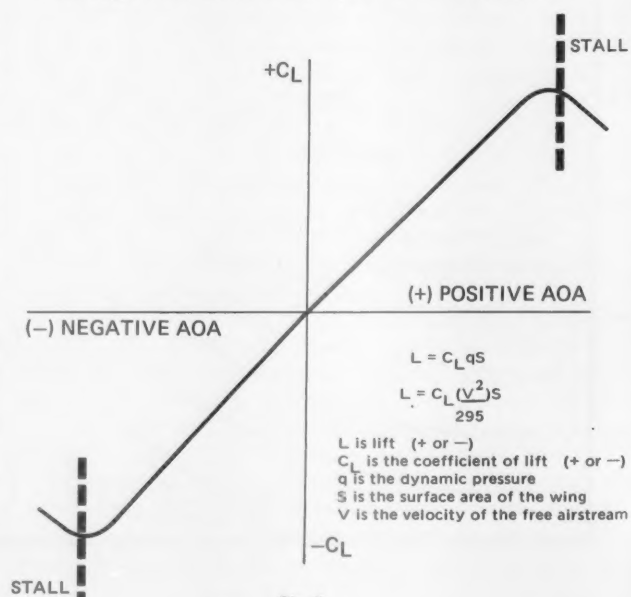


Fig. 3

Diagram represents the theoretical extension of C_L versus AOA for flight parameters under negative AOA conditions for a symmetrical airfoil.

AOA as it changes from an angle below the chord line to above the chord line. *As this occurs, the coefficient of lift is continuously reduced to a value of zero as it corresponds to a particular angle of attack.*

There will then occur a point, corresponding to a certain angle of attack, where the coefficient of lift will take on a negative value. It is at this point that the airfoil begins to generate lift in the negative or opposite direction. This occurs as a result of a high-pressure area developing above the airfoil and a low-pressure area below. This condition becomes possible when the resultant relative airstream comes from above the chord line. Don't allow this dangerous situation to develop!

This immediate reduction in angle of attack may occur with or without dramatic reduction in indicated airspeed. The flightcrew of a transport-category aircraft is at a tremendous disadvantage when not equipped with an AOA indicator. **Under severe microburst conditions, indicated airspeed does not provide a complete reference for adequately deciphering the entire aerodynamic picture.** An AOA indicator, when properly used with indicated airspeed, can greatly assist in the correct evaluation of such a situation.

During *extremis,* microburst conditions, reducing the pitch attitude to maintain or regain lost airspeed can result in a further reduction in angle of attack (and subsequently C_L), a significant loss of altitude, a degradation in climb performance and ground impact.

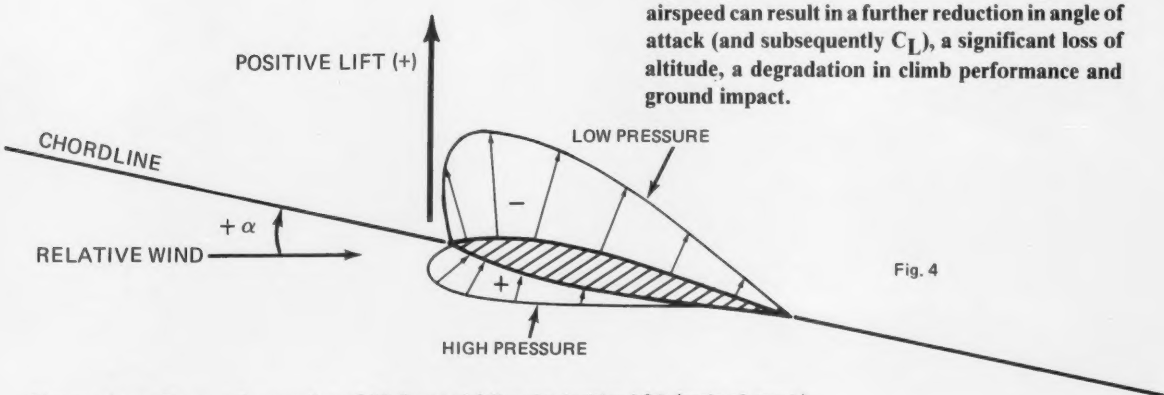


Fig. 4

Diagram shows the normal generation of lift for an airfoil under positive AOA (angle of attack) conditions with a low-pressure area above the airfoil and a high-pressure area below.

Note: Positive, high pressures are pressures above atmospheric pressure, and negative/low/suction pressures are less than atmospheric pressure.

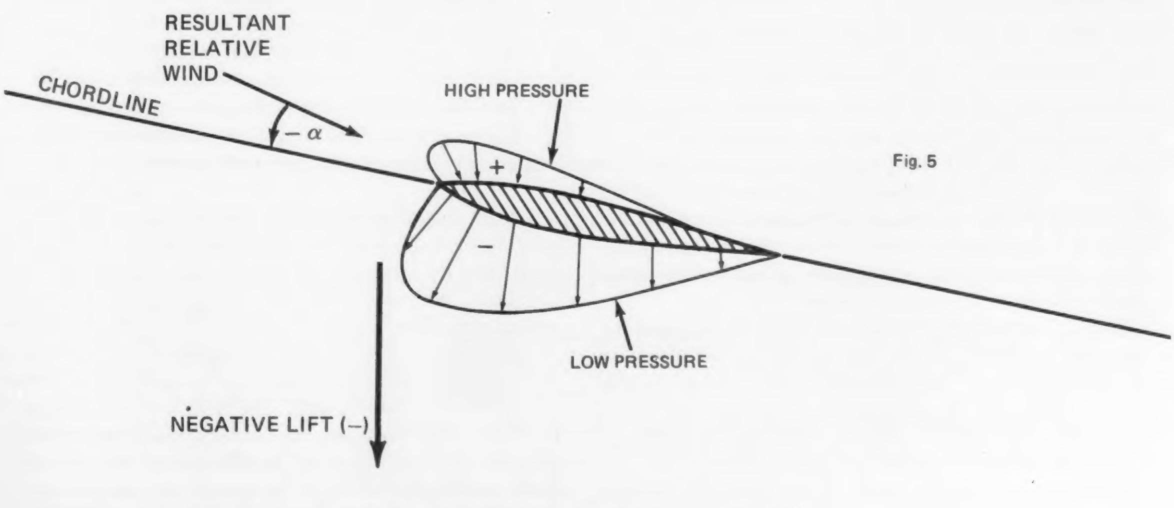
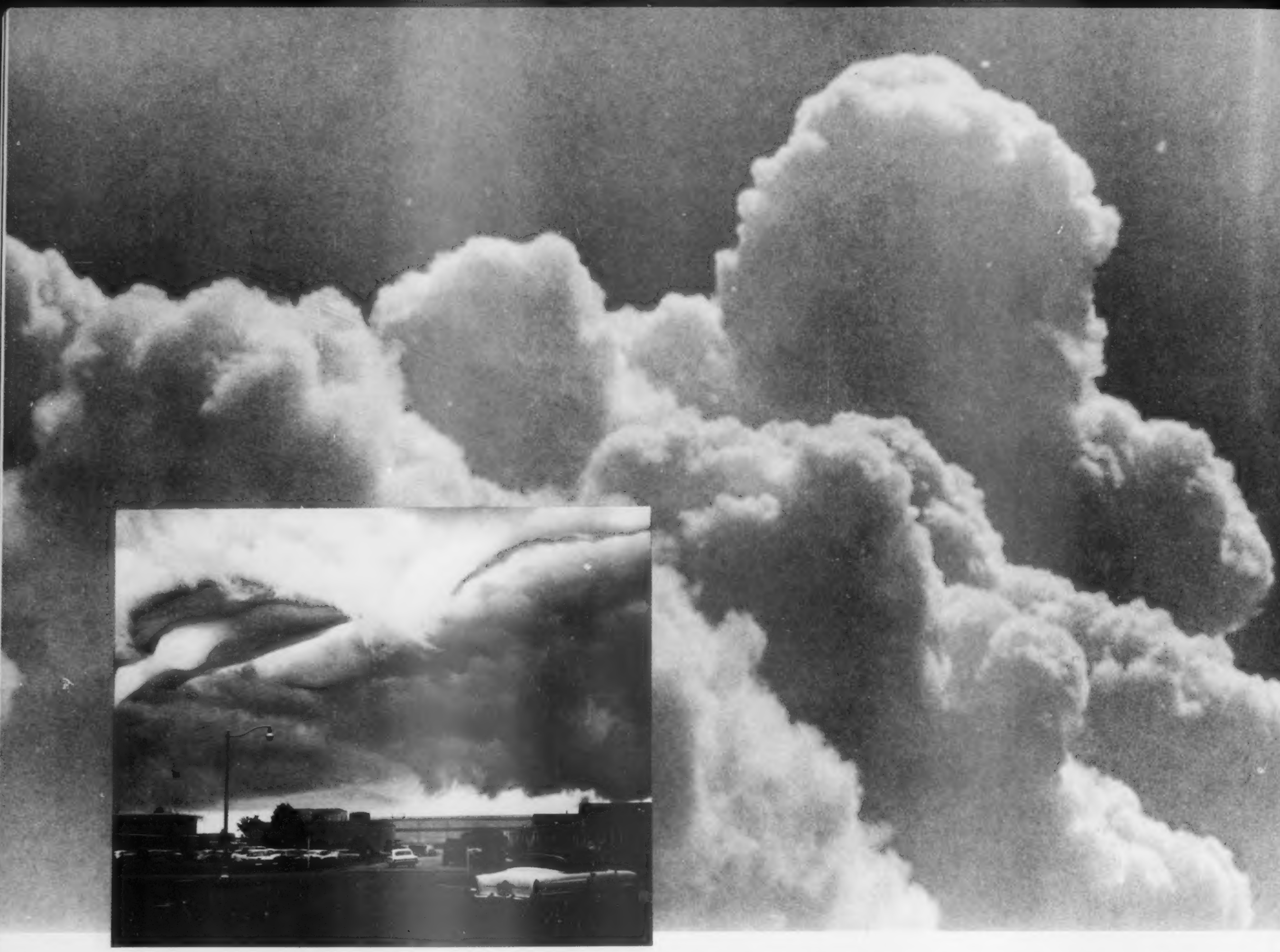


Fig. 5

Diagram shows the inverse generation of lift (e.g., negative lift) for an airfoil under negative AOA conditions with a high-pressure area above the airfoil and a low-pressure area below.

Continued



Synopsis. Under certain conditions, a negative angle of attack can develop during aircraft flight through microburst conditions. This can generate a downward lift vector that results when a high-pressure area has developed above the airfoil and a low-pressure area has developed below. This reversal is the direct opposite of a positive-lift-producing wing. (Navy tactical aircraft could conceivably find their AOA gauge pegged out on the low end of the scale.) Hence, the aircraft can be "drawn into the ground" unless it is immediately and sufficiently rotated to produce a positive angle of attack with subsequent generation of positive lift. This pitch attitude may exceed the maximum pitch attitude normally recommended during a missed approach or takeoff. Always ensure the application of **maximum thrust** simultaneously with aircraft rotation.

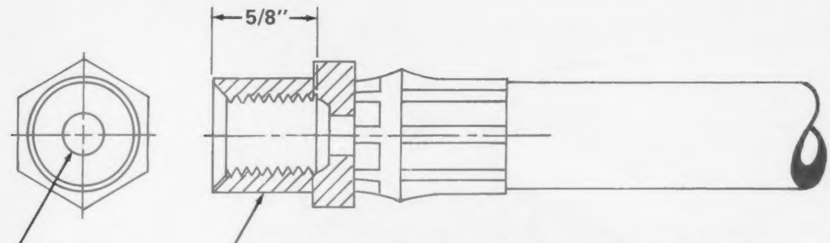
Initially, it becomes imperative to place the aircraft (and consequently the airfoil) in its proper relation to the relative airstream in terms of both *optimum angle* and *acceptable velocity*. Pitch attitude, in relation to the earth, becomes a secondary consideration until the situation stabilizes, at which time the pitch attitude should be reduced.

WHEN CONFRONTED WITH A LIFE OR DEATH SITUATION, APPLY MAXIMUM THRUST, EVEN AT THE EXPENSE OF EXCEEDING ENGINE LIMITATIONS. Besides, if it looks as if you're going to hit the ground, the heck with the engines!

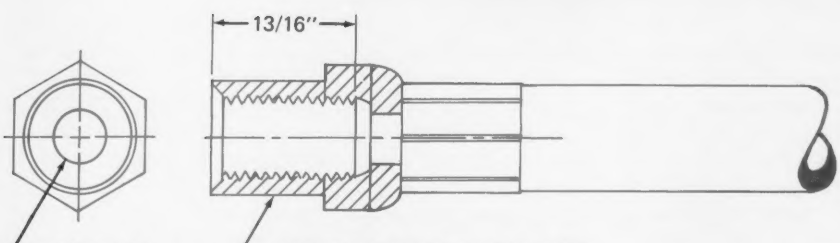
A takeoff or landing should not be attempted when there are mature thunderstorms in the immediate vicinity of the departure or approach corridor. The development of a torrential downburst and associated gust front can produce a dangerous low level wind shear condition that can exceed the aerodynamic capability of your aircraft.

I can't overemphasize that positive avoidance of any potentially hazardous microburst condition is by far the most prudent method of dealing with this deadly phenomenon. We must realize that conditions in nature exist where *a recovery might not be possible, regardless of the actions taken.* Pilots must always remain the masters of their craft, since we alone make the final determination whether to proceed in harm's way. The high sophistication and technical superiority of our modern machines shouldn't cause us to be lulled into a false sense of security, especially when dealing with Mother Nature at her worst. Don't be taken in by this deadly game of Russian roulette.

THE MISSING 7,000



DEFECTIVE BRASS FITTING AND HOSE ASSEMBLY
Imperial Eastman Co. Hose # E705
SAE-100R1 TYPE-AT 2500 PSI WP-279



CORRECT BRASS FITTING AND HOSE ASSEMBLY

A FIRE watch recently discovered a serious safety discrepancy when he attempted to discharge his CO_2 bottle. It didn't work, even though the extinguisher had a full 15-pound charge.

Investigation revealed that the threaded female coupling on the hose assembly (NSN 4210-00-372-0854) was too short. This caused the extinguisher valve's male discharge fitting to bottom out, blocking the discharge orifice. Fourteen thousand of these assemblies had been contracted for; approximately 7,000 were issued.

To make sure your 15-pound CO_2 extinguisher hoses are correct, make the following checks as illustrated:

• Measure the depth of hose threads. The defective hose measures 5/8-inch vice 13/16-inch in the correct hose.

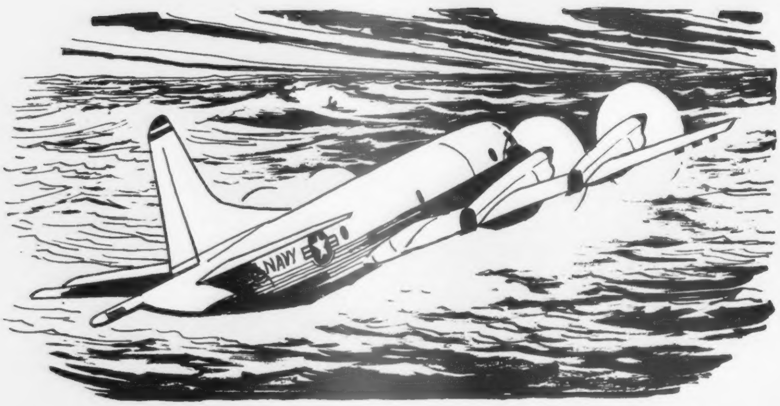
• Measure the hole diameter. The hole diameter is 1/4-inch in the defective hose vice 5/16-inch in the correct hose.

• The defective hose is stamped Imperial Eastman E705-SAE 100RI-TYPE AT-2500 PSI.

• The defective hose will not seal flush to the valve. Approximately two threads are left exposed. The correct hose tightens flush, leaving no exposed threads.

Defective hoses should be reported by the Quality Deficiency Report (QDR), Standard Form 368 in accordance with NAVSUPINST 4440.12D. They should be held in "L" condition pending further guidance from FLETMATSUPPO Mechanicsburg.

Contact LT J. L. Moore, NAVSAFECEN Surface Ship Safety Programs, Autovon 690-1561, commercial (804) 444-1561, for more information.



Crew 10 to the Rescue. In a rescue described as "virtually miraculous," VP-4's Crew 10, homeported at NAS Barbers Point, Hawaii, made possible the rescue of an 11-year-old boy from waters near Cocos (Keeling) Island. Cocos is an island midway between Calcutta and Perth and is inhabited by some 200 Australians.

On 31 July 1982, 11-year-old Nicky Christrives was playing with a styrofoam paddleboard near the reefs surrounding Cocos Island when he was swept off his board, over the reef, and out to sea.

Coincidentally, the members of Crew 10 were concluding an overnight visit in Cocos and were preflighting their *Orion* for the return to Diego Garcia. When tower personel informed them of the incident, Crew 10 expedited the preflight, became airborne within 48 minutes, and began searching for the lost boy.

Even in calm seas, a lone swimmer is extremely difficult to see from the air; the 25-foot waves and foam made the search effort nearly impossible. The crew, flying at 500 feet, combed the area for over 2 hours. Finally, LTJG Roger Rouleau, the copilot, sighted the boy in the water.

Dropping smoke markers to keep him in sight, the crew vectored the island commissioner's rescue vessel into the area. Nicky later reported that the rescue vessel had passed within 25 yards of him at one point, but heavy seas had prevented him from being seen, and wind had overpowered his calls for help.

Nicky was rescued after spending more than 3 hours in the water. He was so exhausted that he'd lost track of time and thought he'd been swimming for only 20 minutes.

After the rescue, Crew 10 landed at Cocos and was greeted by the entire island population. The island administrator, Mr. Hanfield, sent a cable to Ambassador Nesen in Australia expressing his "heartfelt thanks and appreciation" for the "dramatic and virtually miraculous rescue." The crew was also commended by CAPT B. C. Farrar, Commander Task Force 72, RADM G. W. MacKay, Commander Patrol Wings Pacific, and VADM S. R. Foley, Jr., Commander in Chief U. S. Pacific Fleet.

VP-4's Crew 10 members are: LCDR Jim Bock, LT Mark Gardner, LT Gary Dye, LT Bo Roszel, LTJG Roger Rouleau, AD1 John Benning, AW1 Robert Wagner, AMH1 Charles Laba, AT2 Mike Glover, AT2 Milt Anderson, AW2 Stephen Green, AW2 Daryl Ackerman, and AO2 Albert Ammon.

Congratulations and a hearty Attaboy to the "Skinny Dragons" of Crew 10.

A Turn for the Worse. It was 2244 local when a CV's lifeboat and aircraft security watches heard a man scream, reported him overboard, and threw flares and liferings into the water.

A heavy weather condition was in effect onboard the carrier. There were 10-foot sea swells, 4-foot wind waves, 25- to 30-knot winds, a 61-degree air temperature, and a 64-degree sea temperature.

The AN who'd fallen overboard wasn't wearing survival equipment. Although he shouldn't have been there, he'd slipped on an oily portion of the CV's flight deck and tumbled over the side.

A nearby DDG started to close into the SAR position while the CV began a Williamson turn. Because the CV was maneuvering, the SAR helo had to be respotted for launch. As a result, the helo didn't get airborne until 2315. The DDG was using night-vision equipment to attempt to keep the survivor in sight but was having difficulty because of the darkness and weather.

The survivor was using his trousers as a flotation device.

Next, the DDG vectored the helo over the survivor. During the following 40 minutes, the Angel made numerous sweeps and three rescue attempts, but each time, contact was lost because of the heavy swells. From 2355 to 0030, no one could see the survivor. Finally, the DDG

reacquired sight of the AN, who was hanging onto a MK-58 marine flare, and vectored the helo for a mark on top.

The flare went out just as the helo was slowing to a hover, and once again, contact was lost. The survivor then swam to another flare, and contact was regained by the DDG. The helo was vectored into position, a swimmer was placed in the water, and the rescue was successful at 0101.

Here's what the CV skipper had to say about this 2 hour and 17 minute man-overboard SAR:

"We were extremely fortunate in this incident. Heavy seas, wind-blown spray, darkness, no horizon, and the absence of any personal survival equipment made it impossible to maintain visual contact with the survivor for any length of time. Professionalism and the expert seamanship displayed by the DDG combined to make the rescue successful. Additionally, the helo crews were very adept in handling the actual rescue. Lessons to be reemphasized include:

"Remain clear of exposed areas in heavy weather.

"Strobe lights, reflective tape, and whistles are vital to night SAR.

"The survivor was in excellent physical condition and had a strong will to live. Both were big factors in his rescue.

"The CV requested the DDG to remain clear of the survivor and vector the helo for pickup. **This was a mistake.** Since she was the only unit with visual contact, the DDG should have been cleared to close toward the survivor. She was closing in for a pickup when the helo was finally able to effect the rescue.

"High winds and the helo spot put the helo outside the wind envelope as the CV maneuvered. With the DDG closing toward Datum, the CV should have maneuvered to expedite the helo launch rather than close toward Datum and shut down the helo for respot."

The CV skipper is entirely right. Had the DDG prosecuted the rescue of the survivor, it's likely that he would have been picked up much sooner. The SAR unit holding contact in this type of situation must be given the green light to proceed with the rescue. We recommend that all fleet units give this incident the widest possible dissemination.

Bending a Waiver. During the eleventh approach for a night FCLP pass to Runway 24 at NAS Homeplate, the crew of an EA-6B was advised by the tower that a *Cessna* 152 was on a left base leg for landing on Runway 13. The tower further radioed that the *Cessna* would remain clear of the runway intersection. Both the *Prowler's* front-seat fliers could see the 152.

Later, the *Cessna* pilot initiated a waveoff when he was unable to safely touch down before reaching the runway intersection. The EA-6B fliers had just completed a touch and go and were at 200 feet AGL, 140 KIAS when they sighted the 152 at 12 o'clock, slightly high, and very close.

At this point, the tower transmitted, "*Cessna* 152, make a hard right turn, and EA-6B, expedite your climb." Fortunately, a midair collision was avoided, but the crash crew located at the runway intersection estimated that the aircraft passed within 75 feet of each other.

The comments of the NAS Homeplate CO are germane to this close call, and they follow:

"This incident was clearly caused by incorrect and unauthorized procedures on the part of control tower personnel. Investigation revealed that a CNO waiver had been received in 1977 to permit simultaneous use of cross-runways during day VFR conditions only — providing one of the aircraft was lightweight. **For at least 5 years, NAS Homeplate has, without authorization, extended that waiver to include night conditions. The procedure has become second-nature.**

"This is another example of an unauthorized shortcut being employed to expedite landing aircraft. As in any area of aviation — maintenance, operations, or administration — unauthorized shortcuts can exist unseen for a long time before they appear in the form of a tragedy or near-tragedy. One thing is certain; sooner or later, shortcuts will result in a mishap or incident.

"In light of this incident, the local Air Traffic Control facility reviewed its standard operating procedures, particularly as they pertain to lightweight aircraft operations. The NAS Flying Club was directed to examine and evaluate its operating procedures to attempt to uncover and correct any unsafe practices that may have heretofore gone undetected. This hazard was carefully reviewed by all NAS aircrew and ATC personnel during a recent safety standdown. NAS Homeplate will no longer land any fixed-wing aircraft on cross-runways — day or night —in a conflicting traffic situation.

"Additionally, I recommend the widest dissemination of this incident to all aviation activities . . ."

We couldn't agree with you more, Skipper. This article should help to get the word throughout naval aviation.

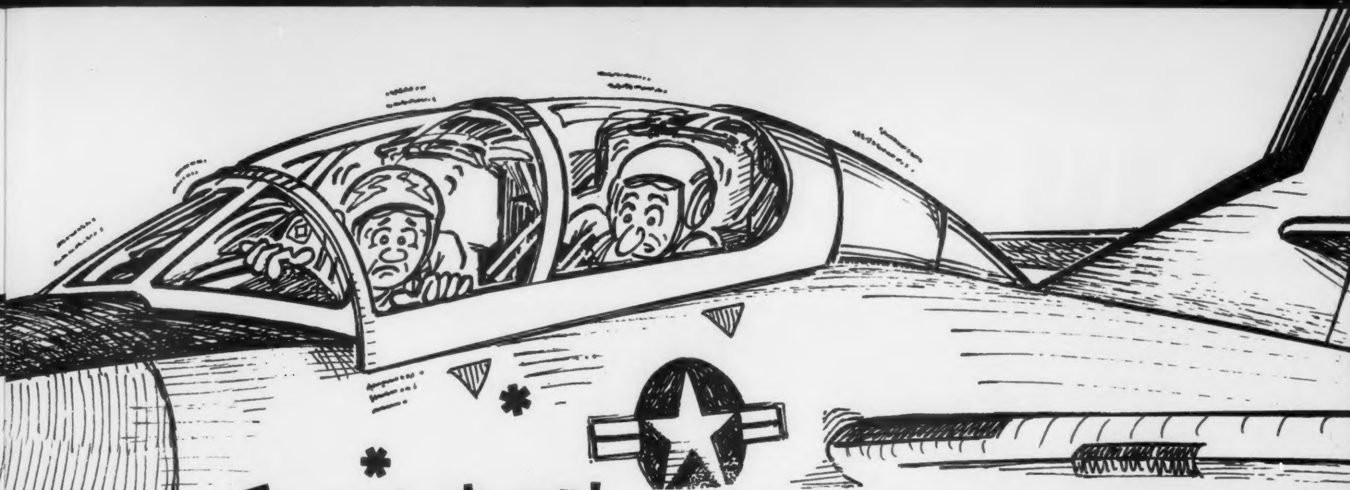
Portable two-way radio,

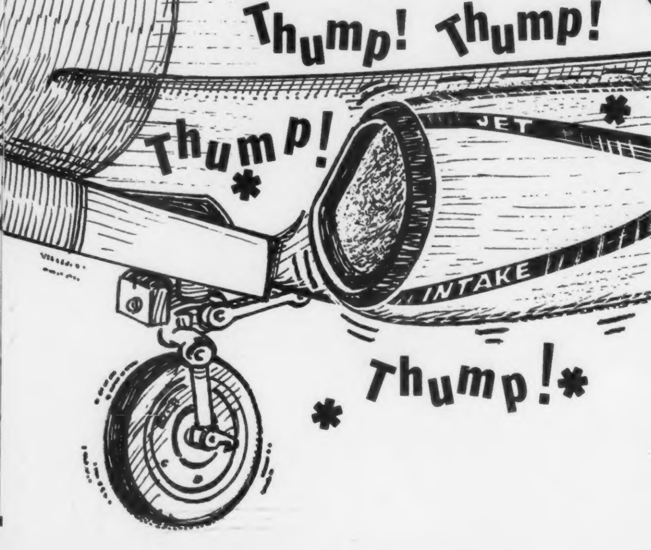
IN addition to their prescribed diet, jet engines have been offered a variety of delicious cuisine, ranging from rags, box lunches, tools, goggles, nuts, and bolts to wallets, work shirts, cranial helmets and, just recently, believe it or not, a *portable two-way radio.*

During a T-2 preflight, the port tiptank was found to be empty. This prompted a hurried call for a yellow fuel truck. While waiting for the truck to arrive, a fuel crewmember placed his portable two-way radio just inside the *Buckeye's* port engine intake. He then became preoccupied with fueling another aircraft and, in the process, forgot about the radio. In the meantime, the fuel truck arrived on the scene and the T-2's port tiptank was topped off. A second preflight was not conducted.

After refueling the other aircraft, it suddenly dawned on the fuel crewmember that his radio was missing. With beads of sweat forming on his brow, he frantically began searching in and around all aircraft being fueled for his lost "squawker."

When his search proved unsuccessful, he stopped himself and began to ponder, "Portable two-way radio, where are you?" He then remembered that the last time he had the





where are you?

By Russ Forbush
APPROACH Writer

radio was when he was waiting to refuel the T-2's port tiptank. Out of breath, he returned to the *Buckeye,* which was now turning up for taxi. He sheepishly glanced at the port intake, but the radio couldn't be seen. Unfortunately, it had been sucked farther down into the intake and was out of sight.

Again, the crew fueler scampered to and fro among the other aircraft, praying he'd locate the missing radio. No joy! Finally, after wasting 25 minutes looking for the radio, he informed maintenance control of his problem.

Meanwhile, the T-2 had taxied to the hold-short area for the duty runway. On engine runup, the pilot heard and felt a loud thumping noise coming from the port engine. He quickly shut the port engine down and taxied back to the line.

During the postflight maintenance inspection, the walkie-talkie was found lying flat against the port engine's stationary guide vanes. Further inspection revealed that no damage had been incurred by the engine or the radio (talk about a real "believe it or not"). It was surmised that the radio had so disturbed the airflow during engine runup that it had caused a compressor stall before it could be chewed up and spit out.

Here was an aircraft mishap waiting to happen — that it didn't was pure luck. Had the T-2 pilot attempted to take off, it's likely that the port engine would have been FODed, possibly resulting in aircraft destruction and death or injury to the aircrew.

There are some important lessons to be learned (or, should we say, relearned) from this incident:

Breaks in normal habit patterns can easily lead to a potentially unsafe situation, and when they occur, all hands must be on their toes to prevent it from happening.

If you can't account for a tool or other piece of equipment, *make it known immediately*. This fueler wasted some 25 minutes after he missed the radio to report that fact to maintenance control. Had he done so at the onset, all aircraft could have been checked before they left the line.

Individuals should never be afraid to report missing tools or equipment. Reprisal against personnel is **not** the object of any equipment accountability program and should not be used as such.

FOD costs the Navy a slew of dollars every year, yet it's a hazard area that can be substantially controlled if not totally eliminated. Strict accountability for all tools, equipment, and other gear brought near or aboard naval aircraft is one of our best methods of control. Success in this area hinges upon the cooperation of all members of the naval aviation community.

A jet engine is like a billy goat — it'll devour anything in sight. But unlike a billy goat, its digestive system can't handle anything but the prescribed diet. Therefore, if we feed the critters what they need, we'll save them from extinction. ◄

Left: LCDR Larry LaLonde, right: LCDR Mark Capansky

LCDR Mark Capansky
LCDR Larry LaLonde
VA-42

FOLLOWING slow-flight checks during a postmaintenance flight in their A-6E, LCDR Mark Capansky (pilot) and LCDR Larry LaLonde (B/N) encountered an extreme, uncommanded yaw after cleaning up their aircraft. Rudder inputs and trim had no effect on directional control. Suspecting an AFCS problem, the crew secured the AFCS in accordance with NATOPS. This, however, did not correct the yaw. The flaps and slats were lowered in an attempt to regain directional control through the use of extended throws of the stab and rudder surfaces. An immediate rapid left roll resulted, which was countered with right flaperon and retraction of the flaps and slats. A straight-in, no-flap, no-slat landing was agreed upon.

Immediately upon touchdown, the aircraft commenced a rapid left drift. LCDR Capansky quickly added power, instinctively engaged nosewheel steering, and became airborne again before reaching the left side of the runway, narrowly missing the port arresting gear engine housing. Prior to commencing a second

BRAVO ZULU

approach, they decided to land on the right side of the runway and make an arrested landing. An uneventful, LSO-assisted, short-field arrestment followed.

Postflight inspection revealed a missing bolt from the input rod of the rudder actuator cylinder. This allowed the 3,000 psi hydraulic system to erroneously position the rudder at random. This situation was far more serious than a disconnect of the rudder actuator from the rudder assembly, which would have allowed the rudder to "weather-vane" with the slipstream.

LCDR Capansky's and LCDR LaLonde's professional approach to this emergency and their superior airmanship saved a valuable aircraft and avoided the potential hazards involved with ejecting from an uncontrollable aircraft over a densely-populated area.

ENS Kevin Lerner
VT-27

JUST after lifting off the runway in a T-28, ENS Kevin Lerner, a student naval aviator, experienced one of the worst sensations in naval aviation — engine failure at low altitude! He established a 110-knot glide and followed NATOPS by completing the abbreviated engine airstart procedure. As he descended to 200 feet, the engine started on prime and ENS Lerner initiated a climbing left turn to low key for a PEL.

He was forced to fly with his left hand while holding the primer engaged with his right hand. When he had to change power and flap settings, it required releasing the primer momentarily. This resulted in several power losses. At low key, due to an unreliable altimeter, he judged his altitude in relation to another aircraft in the pattern and completed a safe landing.

After the incident, a malfunction was discovered in the mixture control section of the carburetor.

Because of his calm exhibition of professional airmanship, ENS Lerner was awarded the Navy Achievement Medal by the Chief of Naval Air Training.

APPROACH is proud to award a Bravo Zulu to a student naval aviator who not only knew the "right stuff" but knew how to apply it!

A fatal near midair

By Richard A. Eldridge
APPROACH Writer

THIS is the story of a student who completed his carquals in a T-2C and had only to return to home base to savor his upcoming designation as a naval aviator. After his final CQ landing, he was positioned on the catapult. Orbiting 1,500 feet above him was his low safety instructor, who was waiting for the student to "come to him" as the third plane in the flight returning to base.

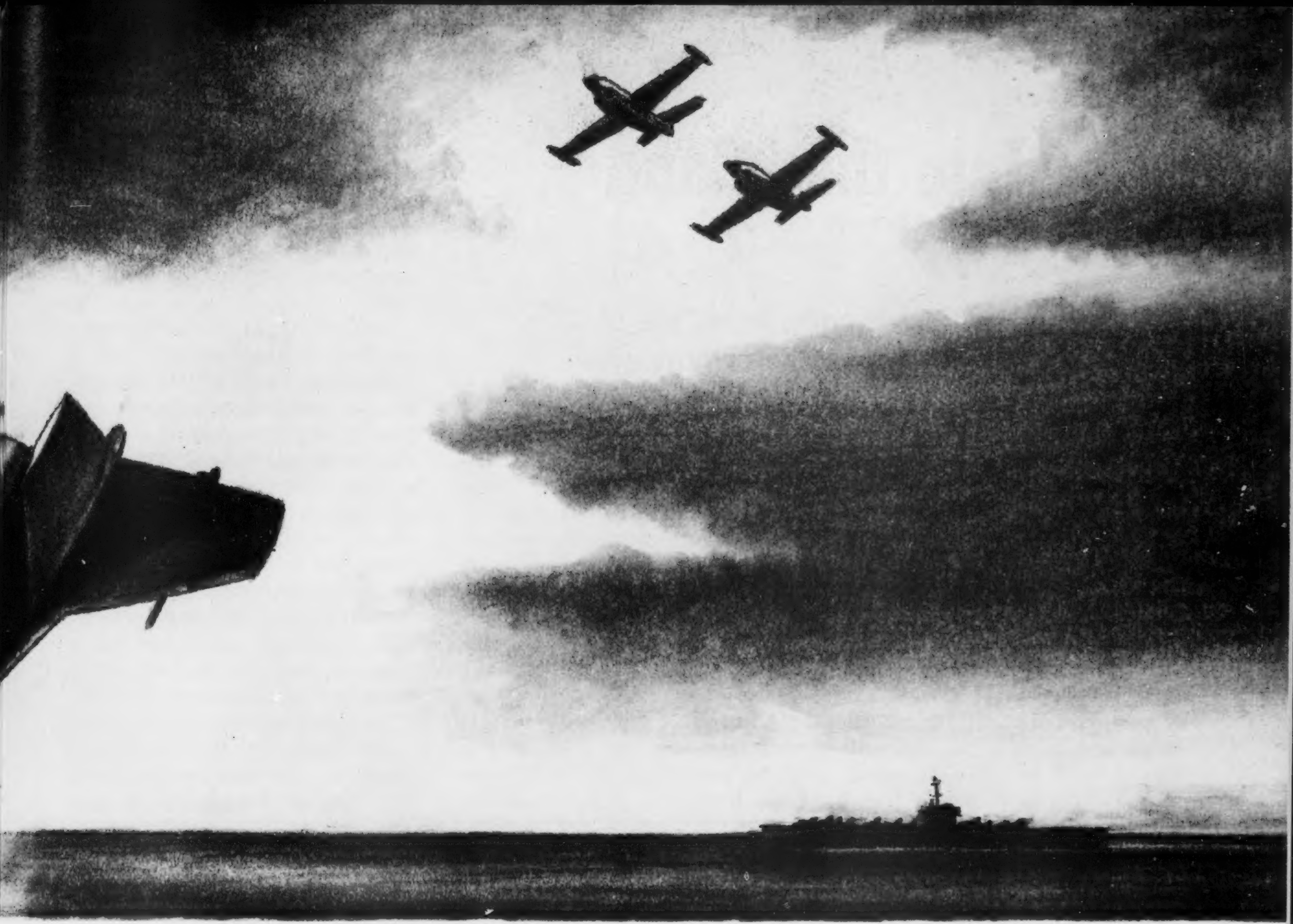
After being catapulted, the student was advised by the low safety instructor that he and his wingman were ready for joinup. The rendezvous was uneventful, and the three aircraft assumed a right echelon formation.

The student, who was now the lead aircraft of the formation, turned past his 325-degree steer to base. Seeing that the student had overshot the heading, the instructor tried to attract his attention by assuming an acute wing position. Still unable to catch the SNA's attention, the instructor rolled out on a heading of 290 degrees. Finally, after turning an additional 30 degrees, the SNA noticed that the other two aircraft had rolled out and he rolled out also.

After notifying the carrier that his flight had rendezvoused, the instructor directed the flight to switch to button 17 (land/launch secondary frequency). Shortly after the instructor's call to switch to button 17, the student began to turn toward the instructor's 9 o'clock position. At the same time, the instructor saw the student looking inside the cockpit (possibly to check the last frequency change). The student's angle of bank and closure rate on the instructor increased rapidly. While flying starboard parade on the instructor, the third pilot in the flight foresaw an impending midair collision resulting from the student's abrupt wing movement toward the instructor's aircraft. Alarmed, he added full power and banked away in a climbing right turn.

The student avoided the instructor's aircraft by passing below him and then rolled rapidly to the left. He was observed to enter a steep nosedown inverted attitude until he hit the water.

A number of observers saw the aircraft splash. The carrier's plane guard helo was quickly dispatched to the



scene. Next, a rescue swimmer was put into the water to investigate a floating liferaft that was attached by lanyard to a survival kit and parachute pack. The parachute was partially deployed underwater in the center of the impact area; the ballistic spreader gun had not fired, however. There were no Koch fittings from an aircrew harness attached to the harness adjustment points. Due to the fire hazard of the ballistic spreader gun possibly discharging into fuel-spilled water, the liferaft survival kit and parachute were sunk.

By shifting his attention from the instructor's aircraft to the inside of his cockpit, the mishap pilot inadvertently allowed his aircraft to drastically increase its angle of bank, thereby setting up a significantly high closure rate toward the instructor. By failing to execute prescribed procedures when encountering an underrun situation (specifically, he allowed an insufficient amount of stepdown to safely clear all other aircraft in the flight), the student moved too close to the third aircraft, necessitating a radical maneuver to avert a collision. After this maneuver, the student failed to recover from the unusual attitude in which he'd placed himself.

As a result of this mishap, a formal presentation by a flight surgeon was incorporated into the intermediate strike CQ lecture syllabus. This presentation reviews and re-emphasizes human physiological factors such as hypoglycemia, stress, vertigo, disorientation, dehydration, and fatigue as they relate to the relatively stressful carrier environment.

Another change brought about by this mishap was to assign all future low safety pilots to an altitude of 2,000 feet over the training carrier, weather permitting. This altitude allows a greater margin of safety from carrier pattern traffic and increases the amount of reaction time available prior to water impact in the event of a collision.

This mishap was most unfortunate in that, upon completion of a demanding evolution (CQ), a routine evolution (joinup and return to base) got out of hand and led to a fatality.

Into the island

By Richard A. Eldridge
APPROACH Writer

I realized I was going to hit the ship, and my life flashed before my eyes.

NOT very many flightcrews have experienced the totally helpless feeling of a slow, misaligned cat shot — fortunately! The three-man crew of this EA-6B had to share just such a sinking feeling, and to complicate matters, it was during a night launch.

The *Prowler* was on catapult No. 1. Tension was taken, the pilot flipped on his external lights, and the catapult fire signal was given.

After the fire signal, the catapult officer saw sparks in the launch bar area, 5 to 10 feet after the aircraft began to move.

Here's how the pilot remembers it: "The catapult then gave the kind of impact you feel just before it fires. After the initial thump, we started forward, and then I felt like we were lurched slightly to the left. I knew at that point that the cat stroke wasn't normal. I looked along the bow to try to judge what kind of speed we had. We were nowhere near flying speed. I retarded the throttles to idle. Then I saw a flash coming from behind me and heard the explosion of an ejection seat leaving."

In the words of the ECMO 2: "I put my head back as we went into tension. As the engines ran up, everything sounded normal. It seemed as if the pilot were taking a little longer than usual to check things out. Then the lights went on and I was anticipating the jolt. I was waiting and waiting, but it never came. Finally, I felt a little bump and we started to taxi forward. I realized then that we were having what everyone hates — a cold cat shot!

"I refused to believe it at first until the pilot said, 'Get ready.' That's all that was said. At that point, it confirmed my decision to eject. Since I didn't know where we were on the catapult and I didn't think we were slowing down, I pulled the lower handle. Actually, I don't remember going through the canopy, but I do remember looking down and seeing the plane disappear below me. My hands were already on the toggles, pulling the life vest open. I heard my life vest inflating and felt the parachute jerk as it opened . . .

"I thought I was coming down on the flight deck, and I was worried about going into another airplane. Then it seemed as if the carrier were going by very rapidly, and I thought I was going into the water, so I went for the Koch fittings. Next I realized I was going to hit the ship, and my life flashed before my eyes. I hit the side of the ship but didn't know what level it was *(he hit the starboard edge of the auxiliary conning station of the navigational bridge, on the 08 level).* It was a very jarring jolt, but I didn't feel any pain from it. After that, I fell into the water."

Let's leave the ECMO 2 in the water and come back to him later.

Following the ECMO 2's ejection, the pilot realized that the *Prowler* was heading left off the catapult, about 15 degrees toward the waterbrake extension on the port bow. He observed an A-7 parked there. He estimated his speed at 15-20 knots, with the aircraft apparently sliding. His feet had been on the brakes from the instant he'd known that the aircraft wasn't going to fly. He felt the aircraft starting to decelerate and told the ECMO1 to "get ready" but then added, "Hold it, hold it" to warn him not to eject yet.

"I was going to steer the aircraft into the A-7 if it looked as if we were going over the side. I could tell we were decelerating sufficiently enough to stop short of the A-7. When we finally came to a complete halt, I pulled the emergency brake."

Back to the ECMO 2, who was struggling in the water, apparently uninjured. He had his mask on and had no trouble breathing. His raft was inflated, and he was attempting to board it with his seat pan still attached. The sea was heavy and very rough. He managed to board the raft a couple of times but was thrown out each time as the raft kept turning over. Then he found his strobe light, turned it on, and secured it to his helmet. He saw a helo approaching but wasn't certain that it had spotted him. Firing four night and two day flares to attract attention, he waited.

When the helo reached him, the ECMO disconnected from his raft and pushed it away. He realized that the helo was having trouble maneuvering to get close. Next, a SAR swimmer flew by on the end of a rope while trolling a harness. Grabbing it, the ECMO hung on for dear life. After holding on and being dragged through the water, he finally snapped the har-

ness onto his D-ring and thought, "Well, at least I'm going with him wherever he goes." After the helo dragged him through the water for what seemed like a long time, the helo stopped and reversed direction rather suddenly, ripping the harness from the ECMO's vest and breaking his D-ring. Then the helo departed.

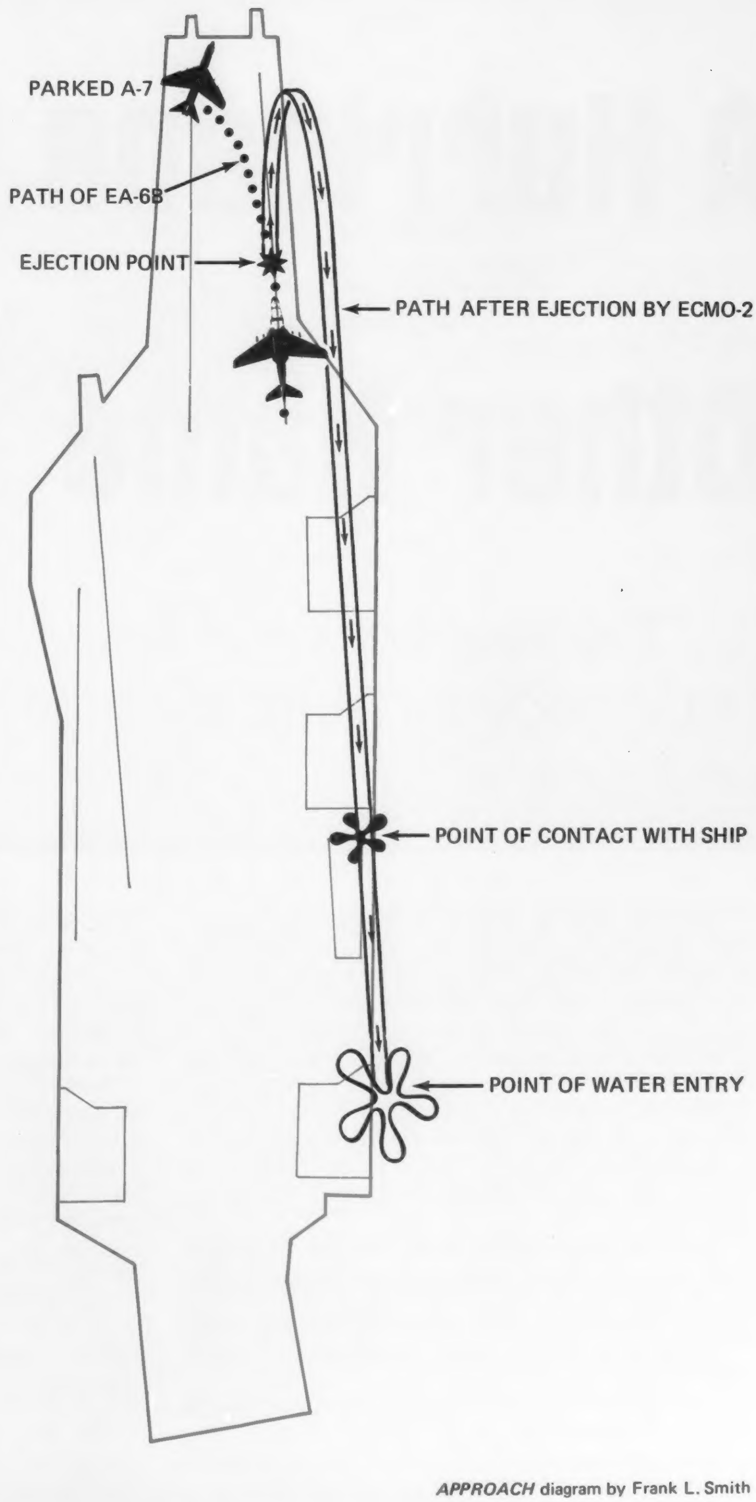
Having been so close to being rescued, and still finding himself in the water, the ECMO was understandably depressed. A second helo was soon on the scene, however, and illuminated him with a spotlight. It took about 5 minutes of maneuvering for the helo to get the swimmer in contact with the ECMO 2. He still had his strobe light on, but it broke loose from his helmet when the *Velcro* peeled off.

After the swimmer had made several passes on the end of a rope, he dropped off about 10 feet away and swam over to the ECMO 2. The first thing he said was, "Are you all right?" The ECMO 2 replied that he was OK, just a little cold. Eventually, after overcoming some minor difficulties while getting strapped into the horse collar, the ECMO 2 was hauled into the helo. Although tired, exhausted, and wet, he was none the worse for wear from his harrowing experience.

In relating his story, the ECMO 2 stated that, aside from his LPA, his strobe light was probably the most important item in his survival.

The insufficient end speed resulted from a misaligned nose launch bar in the shuttle spreader, causing an improper launch bar position in the spreader throat. Another factor contributing to the mishap was the poor lighting around the catapult shuttle area, precluding adequate final inspection. (The catapult guide box partially masks the EA-6B launch bar position in the spreader and hampers this final inspection.)

We feel one interesting recommendation surfacing in the wake of this mishap has considerable merit. What about marking the launch bar with a line of *Zyglo?* The line would be visible and parallel with the catapult launch bar guide when the aircraft launch bar is properly positioned in the spreader.



APPROACH diagram by Frank L. Smith

A Hurricane By Any Other Name

By LT C. D. Sten
VP-10

*"The snowbank had been there for days prior to this incident. A lot of us looked right at it, but who **saw** it?"*

THE night Icelandic weather was deteriorating rapidly. Gale warnings issued by NS Keflavik Metro showed steadily mounting peak winds. After a planning meeting, the base CO cancelled further flight operations and a P-3 slated to return to Iceland was held on deck in CONUS.

In spite of these precautions, however, one last aircraft was already airborne on an operational flight. Weather forecasts at possible divert fields were checked and found to be more severe than the Keflavik forecast, so a divert order was judged inappropriate and was not issued. (The planning was thorough, but it stopped too soon, short of the chocks and chains . . .)

The P-3 landed at NS Keflavik at 0105 local. There was a gale warning in effect for winds gusting to 60 knots, and the tower was calling for runway winds with gusts up to 65 knots on final. Visibility was severely restricted due to high winds and blowing rain. Further hampering ground visibility was a low overcast.

After touchdown, as the airspeed wound down below 60 knots, the flightcrew breathed a sigh of relief. They'd been bounced around pretty heavily, but now they were "safe" on deck. Nobody suspected that the fun was just beginning.

The pilots had the lineman in sight while taxiing inbound on the south taxiway. The intent was to taxi behind another aircraft and spot the *Orion* midway down the west line. Taxi lights were extinguished in accordance with SOP to avoid blinding the lineman. A port turn was initiated, and the P-3 was now under direction of the lineman.

The port turn was nearly complete when the PPC stopped for a suspected obstacle to port. With the port landing light partially extended and turned on, a snowbank "appeared" 8 feet ahead of the No. 1 prop. The pilot secured the No. 1 and No. 4 engines to keep thrust symmetrical. Seeing the snowbank for the first time, the lineman approached the airplane, gave the "cut" signal, and engines No. 2 and No. 3 were secured.

Now the winds were approximately 10 to 15 degrees forward of the starboard wing, and the aircraft was being heavily buffeted by high-force winds acting on the large sail area of the vertical stabilizer. The flightcrew decided to ask for a tow to the parking spot.

A Buddha was called, and a tow bar was affixed to the nose gear. Flight line personnel started shoveling enough snow away to ensure clearance of the No. 1 propeller. As

towing began, the nose skipped to starboard while the entire aircraft moved to port — the *Orion* had weathercocked so that it was forward and to the left of its original position.

The snowbank lay waiting only a few feet ahead of both port propellers, neither of which would clear the obstacle if the aircraft were moved forward. To complicate matters, the Buddha was now well out of position to the left, still parallel to the airplane but with the towbar extending at nearly a right angle to the tractor and P-3. The winds had increased to 65 knots gusting to 75, and the nosewheel was periodically lifting off the deck, even though some crewmembers were positioned forward in the aircraft and the flaps were up in accordance with NATOPS.

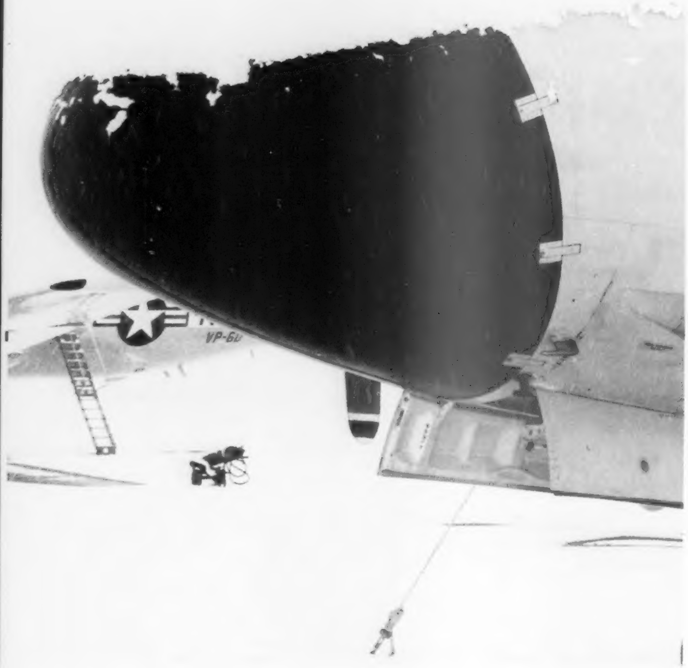
The flightcrew decided to take on fuel and thus increase overall aircraft weight. Although center of gravity would not be improved, lateral movement would be deterred. The port mainmount was chocked to block the aircraft's weathercocking tendency, and the Buddha was repositioned. Shoveling on the snowbank continued. The port props were manually X'ed to increase clearance from the ground. Forty-seven thousand pounds of fuel were taken on with great care, and although nightmarish under such conditions, the fueling was completed without incident. Difficult communications with the trapped and alarmed flight crew occurred by shouting through the hydraulic service center hatch. Even after fueling, the nosewheel would occasionally lift clear.

With the Buddha again in line with the P-3, instructions were issued to the driver to keep going once motion started, as it had been discovered that this procedure helped keep the nose down. The port mainmount came within 2 feet of the snowbank, but the props cleared the leveled top. The other (parked) aircraft was never a factor.

The rest of the towing evolution was finished safely, all the way to a 12-point tiedown. *It had taken 3½ hours to park the airplane.*

Our piece of the action was only part of what was to be an all-around exciting morning. With storm conditions set, the naval station was buttoned up. Steel dumpsters were being blown about like oversized cardboard boxes, while corrugated sidings and sheet-metal "frisbees" flew with unbelievable force and velocity. Still, we were springloaded to think, "Gale warning? No sweat! We get 'em all the time."

The plain fact is, we were darned lucky. The chain of



events that must occur prior to a mishap was almost forged. Snowbanks, lack of adequate visibility, increasing hurricane-force winds, and taxiing in tight quarters were all links in that freezing chain.

Extraordinary precautions for extraordinary conditions were not taken. We were all accustomed to taxiing on the apron behind other aircraft. It was SOP. Unfortunately, snow-removal crews were not aware of our taxi routes and didn't plow to accomodate them. (During high-tempo clearing operations, the perimeters and boundaries shrink as snowbanks grow.) Furthermore, the snowbank in question had been there for days prior to this incident. A lot of us looked right at it, but who *saw* it?

What is a realistic go/no-go wind speed for committing exposed personnel to the line area in non-emergency situations? Is such a parameter going to be equally applicable in icy as well as dry ramp conditions? These are questions that must be hashed out at the squadron level, for guidance from higher authorities is, of necessity, more general. During this particular evolution, two people lost their footing, and if it weren't for the timely intervention of a buddy, they'd have been blown in a direction dictated solely by the wind. Had the aircraft turned toward her spot with all four engines in normal RPM at the power settings required to overcome the effects of 75-knot headwinds, and had the lineman lost footing and been propelled forward with the wind at his back, the result could have been devasting.

Many aerodromes have prevailing hostile meterorological phenomena for which they are famous (or infamous). These include high winds or shears, abrupt thunderstorm activity, high humidity and a myriad of other environmental idiosyncrasies. While dangerous to the uninitiated, such conditions can be equally hazardous to the calloused aviator who operates with those specific weather adversities on a daily basis. The "fresh eye" tends to be too completely shaded by the "old hat."

On that violent Icelandic night, the word "hurricane" was never mentioned, and rightly so. There was no associated cyclonic low, and the barometer stayed nice and high. Still, we learned that a hurricane by any other name still scares the heck out of you.

The "fresh eye" tends to be too completely shaded by the "old hat."

LETTERS

Getting Away with Murder?

Pearl Harbor, HI — Re: "Hang in There Guys" in your October '82 issue, the ultralights don't get away with murder *completely*. Under recently-issued Part 103 of the FARs, no person may operate an ultralight (or lawn chair, or whatever) within any Airport Traffic Area, Control Zone, Terminal Control Area, or Positive Control Area without having prior authorization from the Air Traffic Control Facility having jurisdiction over that airspace.

True, the pilots need no certificate if their craft are under 254 lbs., but this doesn't mean the FAA can't take enforcement action. The guilty party could be fined, for example. Or the FAA could take action against *any* FAA certificate the person holds (and many *are* certificated pilots/mechanics/flight engineers, etc.).

Just how the NAS is to track these guys down may be another matter. Maybe we're going to see the DOD or contract cops patrolling in their own (NAS) ultralights??!

Hang in there, guys.

CDR Dave Luehring
COMNAVLOGPAC STAFF

More on Wind Shear

Montreal, Canada — LCDR Towers's article ("Low Level Wind Shear and Naval Aviation," September '82) is delinquent on two counts: First, he writes that "... the flightcrew's awareness of the wind shear phenomenon, combined with the successful execution of certain tactics, undoubtedly prevented a major catastrophe." But from his account it appears that the crewmembers were *not* aware that they were in a wind shear situation. With an "indicated airspeed" that "began to decay rapidly" and a rate of descent increasing to 1,000 fpm, they followed normal missed-approach procedures by rotating 10 degrees up and "setting the thrust levers for go-around power." In other words, the power they applied was too little and, at 800 feet AGL, probably too late. Only when the descent rate had increased to a startling (to say the least) 1,500 fpm and "then to 2,000 fpm" (not startling but terrifying, yet the crew was only "somewhat alarmed") . . . did they advance power [to maximum thrust] ... Again, too late — almost. Not too little, because it's all the crew had.

The second delinquency is one of omission: the article gives the impression that wind shear is only to be found in or around thunderstorm activity. This is surely not the way to alert navy pilots to the hazards. If there is a navy myth that "military aircraft are not affected by wind shear," then I would have thought that an official safety publication would wish to eschew giving the impression that wind shear was exclusive to thunderstorms and down-outbursts.

C. A. Morrison
Editor
Canadair Service News

LCDR Towers Replies . . .

San Diego, CA — In response to my delinquency with respect to omission, I deliberately concentrated on thunderstorm-generated, low-level wind shear in "Low Level Wind Shear and Naval Aviation." I have long believed that this is by far the most deadly type and that it presents the greatest potential for disaster. To be sure, wind shear can originate from other sources. To quote my December '81 *APPROACH* article ("Wind Shear: Mother Nature At Her Worst"): "Wind shear may orginate from frontal passage, land or sea breezes, jet streams, or thunderstorms." And, as you correctly stated in your September '82 *CANADIAN AVIATION* article, strong surface winds with obstructions, mountain waves, and valley effects (wind funneling). Not to mention one we both forgot — wind shear may also originate from strong temperature inversions. It was not my intent to imply that wind shear is generated only by thunderstorms. Your point, along with this clarification, will hopefully alleviate any misconceptions.

Now, in response to your first assertion, I can only state that you have made several excellent points. Still, I'm sure we both agree that some credit is due the crew, since they unquestionably succeeded where many others have failed.

LCDR Joseph F. Towers, USNR
VR-57

From a 747 Pilot

Westerly, RI — I am a retired American Airlines 747 Captain. Half of my long career has been spent as an engineering test pilot and research engineer. In the course of a year-and-a-half consulting assignment on the wind shear problem, I came across LCDR Joe Towers's article, "Low Level Wind Shear and Naval Aviation," in the September '82 issue of *APPROACH*.

I was impressed with LCDR Towers's analysis of the extremely dangerous nature of this rare phenomenon and specifically his emphasis on the severe loss of angle of attack that can occur in a downburst.

I flew across the country to talk with LCDR Towers about the operational requirements for an onboard warning system and the need to program an escape mode into the integrated flight director system.

I was happy to learn that he already had a second article in preparation. (See "Blueprint for Disaster," page 2 of this issue. —Ed.) Joe Towers's next effort should help clear up some of the what-should-we-do-about-it questions that still cloud the solution to the wind shear threat.

APPROACH is to be commended for addressing this vital safety issue. I am looking forward to LCDR Towers's next article.

Captain S. P. Saint
Aviation Consultant

November '82 Back Cover

Norfolk, VA — Your November '82 issue is, as always, a storehouse of information and thought-provoking viewpoints. Your colorful back cover, however, has started all of our VERTREP aircrewmen buzzing with questions and comments concerning the reason this photo was used, along with a few snickers by others.

Specifically, your photo on the back cover has seven flagrant NATOPS violations, which are:

1. Emergency release cable is not hooked up.
2. Safety release cable is not hooked up (left side of photo shows cable in stowed position).
3. Electric release is not installed.
4. Crewman's hand is on the beam and emergency release bellcrank, with no drop platform underneath aircraft.
5. Flight deck vest (Mk-1) is worn vice the required LPA-1.
6. Cargo rail is improperly stowed for flight.
7. Aircraft deck shows worn non-skid down the center, which could be a safety hazard due to slippage.

In my squadron, these violations would be grounds for a crewman's qualifications to be reevaluated.

On a positive note, we're sending you 50 slides which, we hope, colorfully illustrate proper VERTREP techniques.

ADC Roger J. Gerhardt
HC-6

• We appreciate both the corrections and the slides. The back cover photo, taken less than 6 months ago, was not snapped in a darkroom. It's the "real thing," shot during an actual VERTREP from a deployed carrier, so we're glad the discrepancies have come to light. Keep up the fine work. — Ed.

Mishap-free flying...
is there a formula?

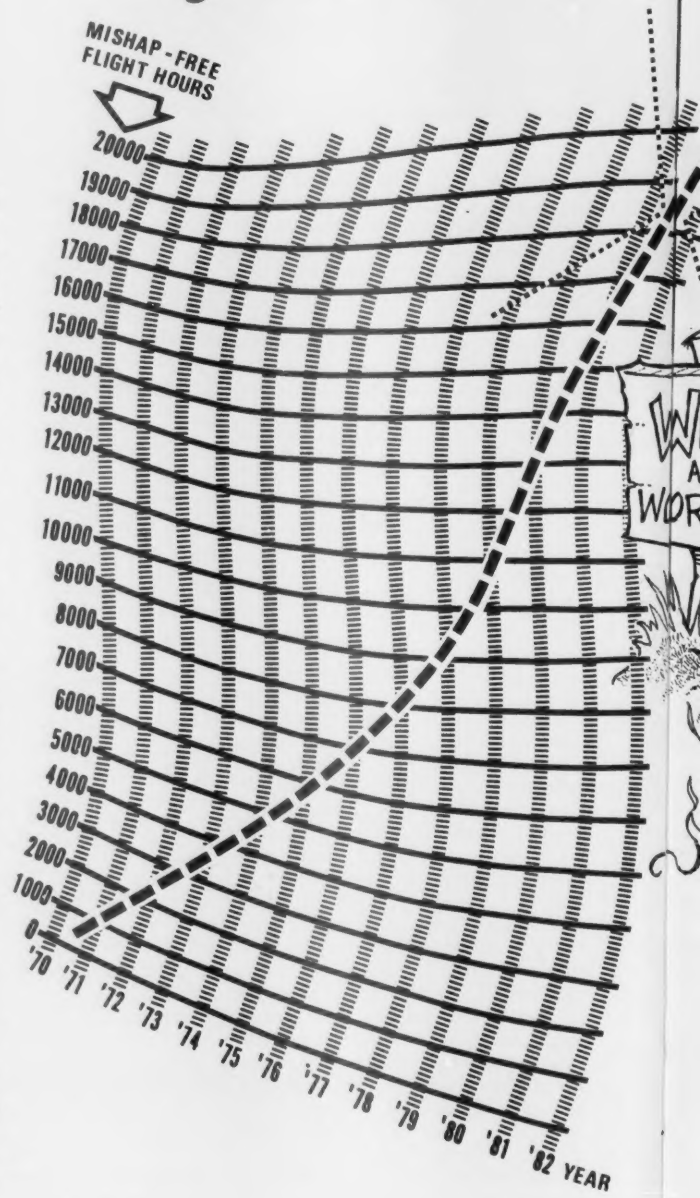
By LCDR F. E. Ogden
VAQ-132 ASO

TWELVE years. How did it happen? How, when to some external (and internal) Navy critics the sky was raining *Prowlers,* did VAQ-132 manage to counter the trend and continue a high tempo of operations without a mishap? As ASO, this question has been on my mind for some time. If I could find the formula I would patent it, put away my 3750.6M, go to the readyroom to pour a cup of coffee, and actually smile (a form of expression rarely seen on your friendly ASO's face). To this end, I decided to analyze the inner workings of my squadron to see if there were any separately-identifiable factors unique to VAQ-132 that could have accounted for this remarkable feat, a rarity for a TACAIR unit.

First I looked to see if we were somehow exposed to fewer hazards than other squadrons. No surprises here. Since 1970, we've logged traps on 13 different carriers in all of the world's major bodies of water. From Southeast Asia combat operations to exercise Ocean Venture in the North Atlantic, we've performed missions ranging from routine single-plane instrument training to night multiaircraft low-level adversary strikes. For the past 12 years, we've flown the EKA-3B and all three versions of the EA-6B *Prowler.* During this period, the squadron has been led by 11 different commanding officers who provided guidance to a multitude of officers and enlisted personnel. The aircrew have ranged in quality from the "hand-picked" second-tour guy to the average "pot-luck" nugget.

The quality of the maintenance personnel has, of course, followed the trends which have existed Navywide. At times, key supervisory billets have not been manned by EA-6B-experienced petty officers due to the large influx of petty officers from other locations and aircraft types. (Whidbey Island is a good place to be. Many military personnel use reenlistment incentives to get here.) Conclusion: Exposure to hazards and high-risk environments is at least as great as most TACAIR units, and higher than some. So, if we didn't keep our aircraft in the barn and we didn't keep people who were capable of making mistakes from working on or flying them, what did we do?

The guys in the back row of the readyroom say (they always have something to say, usually out of turn) that



On 23 August 1982, the Scorpions of VAQ-132 reached an unprecedented EA-6B milestone: 12 years and 18,600 mishap-free flight hours. —Ed.

perhaps we've been lucky. We all have a few of those I'm-lucky-to-be-alive sea stories, so examining the luck issue has merit. Webster's defines "lucky" as follows: "producing or resulting in good by chance . . . producing unforeseen success." That definition sort of flies in the face of all those who think they have the "right stuff." As Tom Wolfe said in the September 1982 issue of *APPROACH*, ". . . There is a curiously safety-minded attitude built into the code I have called The Right Stuff. And it is this: no true believer in the code can accept the notion that his sublime and righteous stuff can be extinguished by anything as banal as an accident — i.e., a chance mishap against which his will and skill are powerless."

Mr. Wolfe uses some interesting and recognizable words and phrases in that short quotation. He defines an accident as a "chance mishap." With the advent of OPNAVINST 3750.6M, the Navy decided that there was no such thing as an accident or a "chance mishap." Only mishaps exist, and they occur because someone or something caused them. If the cause had been known or recognized soon enough, the mishap would not have occurred. Therefore, all mishaps are preventable. The definition of "lucky" also talks of producing unforeseen good by chance. Here I have to stop. Chance . . . accidents . . . good fortune . . . luck. No way. The squadron had to be doing something right. But what was it?

Naval aviation in general and VAQ-132 in particular *plan* to prevent mishaps. Chance is being programmed out of existence. There are numerous programs and activities that contribute to the mishap-prevention effort. Many of these aren't labeled as such, but without them, mishaps would be more likely. Consider "A" schools, FRAMPs, readiness squadrons, NATOPS, NAMP, and even LMET as examples of programs that are not labeled "safety" but play an extremely important part in how we in naval aviation do things. In this squadron, as in most, there are standard operating procedures and maintenance instructions covering organizational training, job and flight qualifications and requirements, tool control, FOD prevention, and others. They too don't have "safety" in the title but have a direct impact on mishap prevention.

Finally, we get to the squadron's safety program. What does it say? Aside from delineating specific safety training requirements, the safety program simply charges all hands to do the jobs for which they have been trained — in accordance with the instructions and programs already in existence. In other words, the safety program mandates *professionalism*.

But all of this doesn't happen just because it's written down. My search for the VAQ-132 fountain of safety was not as fruitless as Ponce de Leon's search for that other fountain. I found it. It springs forth from the commanding officer and becomes a raging torrent by the time it reaches the hangar deck and flight line. Supervision, at all levels, is the fluid of the fountain. Excellence is demanded in planning, briefing, flying, and quality of maintenance. Deviations or shortcuts are constantly guarded against. Hazards are identified, eliminated, reduced, or at least acknowledged to reduce mishap potential. Call it safety awareness or good leadership, the essence of the VAQ-132 safety record is 12 years of working and flying as hard as possible . . . *but doing it the right way*.

Even though we *Prowler* fliers believe in and employ magic (ECM) in our mission, in my search, I could find no magic that could be applied to guarantee a mishap-free future. Therefore, smiling will have to be reserved for happy hour and that special woman's touch. But the scowl can be discarded. In its place a look of determination can be found. It is similar to the expression found on *Scorpion* faces throughout the squadron and reflects a strong desire to continue to do the job correctly, and therefore, safely. ◄

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Real Aviators Don't Read

REAL AVIATORS

—Never read NATOPS: "Everyone knows NATOPS is for Nurds, Safety is for Sissies."
—Don't believe in briefs, debriefs, or checklists: "Whoever learned about flying by talking about it?"
—Don't believe in preflights (unless someone is watching them): "This aircraft has had its daily, hasn't it? . . . If it flew in, it'll fly out."

Famous REAL AVIATORS

George Peppard
Waldo Pepper
Wrong Way Corrigan
Mickey Rooney and William Holden
Humphrey Bogart
Slim Pickens
Robert Duvall
John Wayne
Robert Conrad
Dilbert
Jonathan Livingston Seagull
Anybody in Launch 'Em

Famous NATOPS Readers

Jimmy Thach
Alan Shepard (except when golfing)
John Glenn
Robert Crippen
Anymouse
Grampa Pettibone
Every Gray Eagle

REAL AVIATORS

—Always have nicknames like Sluggo, Speedy, Ace, Dusty, Ski, or Big (anything).
—Never write "up" gripes: "Leave those for the nuggets."
—Always have personalized flight gear, to include the mandatory helmet lightning bolts and nametags with Sluggo, Speedy, Ace, Dusty, Ski, or Big (anything) on them.
—Always add at least 1,000 hours to their flight time when in a bar (2,000, if females are present).

NATOPS

By LCDR John G. Holewa
HSL-35

Recommended REAL AVIATOR Diet

Breakfast

—Bowl of cigarettes
—Gallon of coffee (add sugar if night flying tonight)
—½ dozen donuts (except if flight physical within 2 weeks)

Lunch

—2 or 3 *Hershey* bars (must be consumed during climbout)
—*Diet Pepsi*

Supper

—2 TV dinners
—½ gallon *Baskin-Robbins*
—1 pitcher of margaritas (salt on glass mandatory)

REAL AVIATORS

—Never submit NATOPS changes: "They should have written it right in the first place . . . Why change something I ain't gonna read anyway?"
—Always log all their night time as instrument time: "3710 is all screwed up."
—Never memorize all those niggly limitations: "They wouldn't have painted little white and red stripes on the gauges, right?"
—Think crew rest is when the autopilot is on.

Things You'll Never Find in a REAL AVIATOR'S Flight Suit

1. NATOPS Pocket Checklist
2. TCA, sectional, or any other *current* chart
3. Earplugs
4. Flashlight (**REAL AVIATORS** don't fly at night.)
5. Flight gloves (who wears flight gloves?)

Continued

10 Things You'll Always Find in a REAL AVIATOR'S Flight Suit

1. Screwdriver or a "Snoopy" dzus key
2. Twelve-bladed *Swiss Army* knife complete with *Phillips* screwdriver
3. Butane lighter
4. 10-year-old Falcon Code list
5. *Vick's* nasal spray
6. 4 old *Contac* capsules
7. 2 Caesar's Palace poker chips
8. Little black book alphabetized by cities with good country-western bars adjacent to AFBs
9. Program from last year's Tailhook Convention
10. Dicecup

REAL AVIATORS

—Don't believe in DD-175s; they file in flight.
—Don't believe in TCAs and all that other ATC garbage: "It's my word against some controller, and after all, I'm the REAL AVIATOR!"
—Don't study tactics: "Leave that for the eggheads and ground-pounders in Washington."
—Hate helos until it's dark and they're wet and scared.

SQUADRON BILLETS

REAL AVIATOR

—Functional check pilot ("I can really wring it out . . . Push it to the limits.")
—Stan pilot ("He got it started, out and back, and shut down without looking at the book once. He done real good!")
—Instrument check pilot ("He remembered it was white on top, black on the bottom for the whole hop. He done sorta good.")

NATOPS READER

Commanding Officer ("Doesn't fly enough to be a **REAL AVIATOR**.")
Executive Officer ("Too worried about setting a good example to be a **REAL AVIATOR.**")
Safety Officer ("Real Pansy.")
NATOPS Officer ("Even bigger Pansy.")
Maintenance Officer ("Spends far too much time preflighting.")
Administrative Officer ("Ever heard of a **REAL AVIATOR** who pushed paper?")
Operations Officer ("He's too worried about whether he divulged any classified info on his last phone call.")
Flight Surgeon ("You must be kidding!")
LSO ("You must *really* be kidding!!")

REAL AVIATORS

—Never exercise: "You only have X amount of heartbeats . . ."
—Never fool with instrument hoods: "It interferes with my scan."
—Never report overspeeds, overtemps, etc., because* REAL AVIATORS *"Never have overspeeds, overtemps, etc." Besides, "Some four-eyed engineer has added a fudge factor."

REAL AVIATOR Vocabulary and Cliche' Guide

"Gizmo(s)"
"Doodad(s)"
"It came off in my hand, Chief."
"Waveoff, hell. I had the ball."
"I swear, it never came close to redline."
"You have to go out, you don't have to come back."
"What do you mean I need an alternate?"
"If he knows so much, how come he's not a flier?"
"Name me someone who doesn't blow a tire now and then."
"Mayday" — A term used by doctors in *Cessnas* and Air Force transport drivers. Used only once by **REAL AVIATORS** in VT-1.

REAL AVIATORS

—Gaff off NATOPS quizzes: "There goes the NATOPS puke getting his FITREP filler again."
—Don't believe in aerodynamics, they just "cob it."
—Always wear rings while flying (except wedding rings on cross countries).
—Always plan their annual leave during the squadron annual NATOPS evaluation.

What Do They Do When They Get Out?

REAL AVIATORS	NATOPS Readers
Crop duster	Airline pilot
Bush pilot	FAA consultant
Air America (etc.) pilot	NTSB investigator
Used car salesman	Insurance salesman
Bookie	Stockbroker
Numbers runner	Banker
Stuntman	Department–store floorwalker
Get bolder	Get older

Continued

REAL AVIATORS

—Never go around.
—Never go around thunderstorms.
—Never go around anything.

FAMOUS LAST WORDS BY REAL AVIATORS

"Just throw it in the back there."
"It's better to die than look bad."
"If it's not leaking a little, this isn't a real (fill in aircraft type)."
"It's probably just the gauge."
"The weather was fine when we took off."
"Let me show you how it's really done!"
"Hugging the ground really develops my flying skills."
"What mountains?"
"I've got this route memorized."
"NOTAMS?"
"This LSO (LSE) doesn't know his paddles from a hole in the ground."
32 **"We can go a little further if we just (pick one)."**
—Lean out the mixture.
—Pull one out of FLY.
—Feather No. 1.
—Get it down in ground effect.
"If this SOB will hover, it'll fly."
"You've got it!!!"
"*OK, No. 3, we're not going to make it. Tuck it in, and let's look good!*"

Commanding Officer's Guide For Mishap Investigation Report Endorsements

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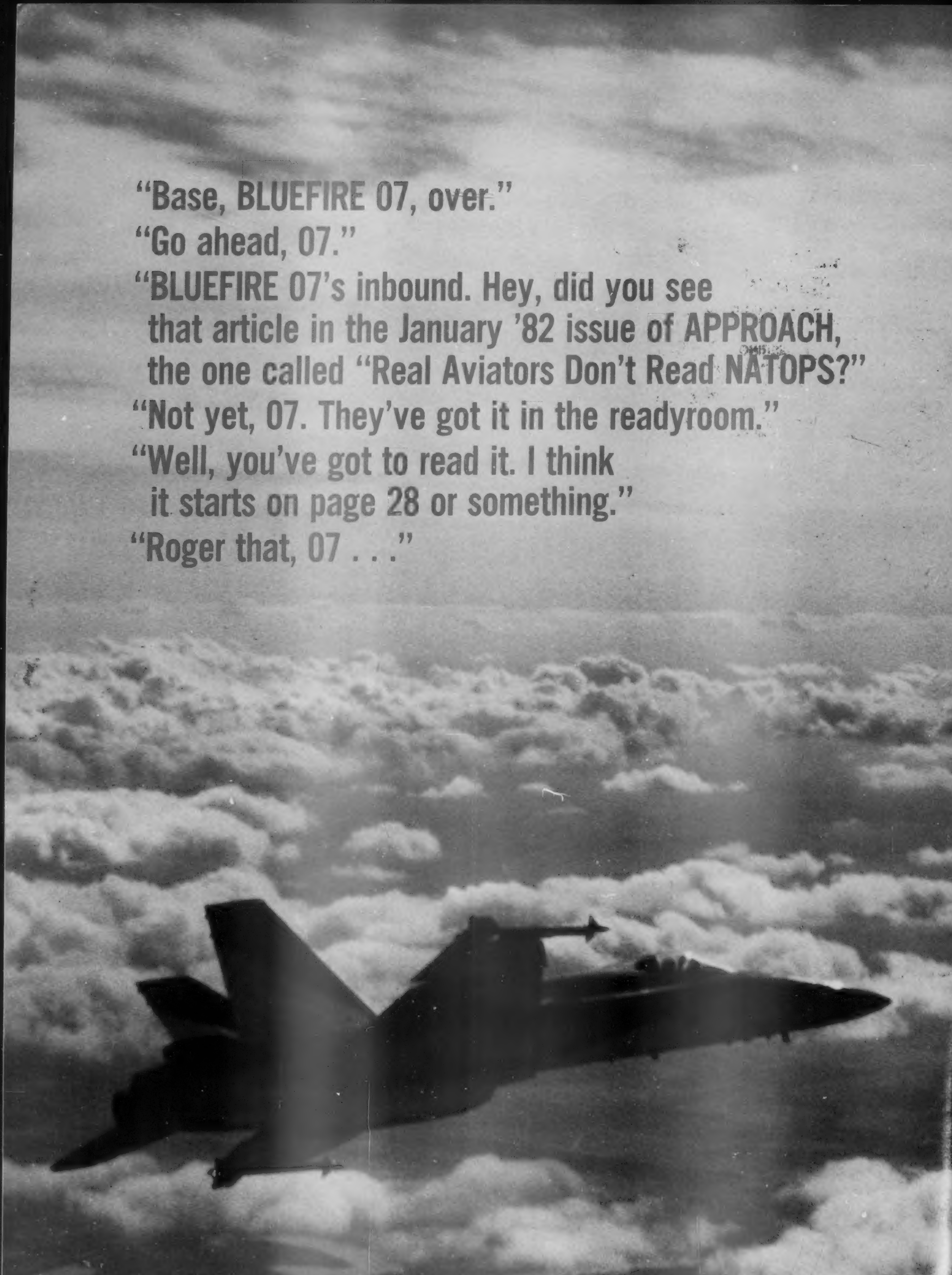
"He was our best pilot . . . a REAL AVIATOR."

I am looking
for a place
to happen.
I was here first,
but now the
skies are crowded.
If you become
careless
or inattentive
for only a moment
I will be there
when you least
expect me.
I am an accident.

Don't let me happen to you.

Naval Safety Center
NAS Norfolk, Virginia

Poster idea contributed by VA-97 Safety.


"Base, BLUEFIRE 07, over."
"Go ahead, 07."
"BLUEFIRE 07's inbound. Hey, did you see that article in the January '82 issue of APPROACH, the one called "Real Aviators Don't Read NATOPS?"
"Not yet, 07. They've got it in the readyroom."
"Well, you've got to read it. I think it starts on page 28 or something."
"Roger that, 07 . . ."